First-Rank Symptoms of Schneider in Late Paraphrenia

Cortical Structural Correlates

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The brains of 41 late paraphrenics, 16 of whom had first-rank symptoms, were examined by CT. Late paraphrenics with first-rank symptoms had significantly less cortical atrophy than those without them.
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The application of computerised tomography (CT) to psychotic illness in both the general adult and elderly 'functionally' mentally ill has repeatedly demonstrated abnormalities in brain structure. Enlargement of the lateral ventricles has been reported in schizophrenia, affective disorder, and late paraphrenia (Naguib & Levy, 1987), accompanied by cortical atrophy in schizophrenia and affective illness, whereas in late paraphrenia corresponding cortical changes have not been found: late paraphrenics show uniform and normally distributed lateral ventricular dilatation, uncoupled from the usual association with sulcal widening that occurs in age-matched normal controls (Burns *et al*, 1989).

Although there is no general agreement on the prevalence of significant cerebral organic pathology in late paraphrenia (Holden, 1987; Naguib & Levy, 1987; Levy *et al*, 1987), the degree of cortical atrophy, as measured by widening of the cerebral sulci and fissures, is inversely proportional to length of illness (Burns *et al*, 1989). The presence of delusions in Alzheimer's disease has been shown to be inversely related to cerebral sulcal widening (Jacoby & Levy, 1980*a*), leading to the suggestion that in such an organic cerebral condition, delusional activity requires a relatively intact cortex.

The relative prevalence of 'first-rank' symptoms in late paraphrenia has been a matter of some debate (Grahame, 1984; Levy *et al*, 1987). Trimble (1990) has suggested that Schneiderian first-rank symptoms should be seen as signifiers of dominant temporal lobe pathology rather than pathognomonic of schizophrenia. The aim of this study was to re-examine the cortices and lateral ventricles on CT of late paraphrenics who have been the subject of earlier publications (Naguib & Levy, 1987; Hymas *et al*, 1989; Burns *et al*, 1989), and to see whether the presence of first-rank symptoms is associated with any specific abnormality of the temporal lobes, cerebral cortex, or lateral ventricles.

Method

The population sample and inclusion criteria have been described by Naguib & Levy (1987). The 41 late paraphrenic subjects were attending the Joint Hospital as in-patients, out-patients or day patients. The 40 normal controls were living independently in the community.

Presence or absence of Schneiderian first-rank symptoms (FRS) was assessed in the initial examination of cases by the Geriatric Mental Status Schedule (Copeland *et al*, 1976) and by further retrospective examination of the Maudsley Hospital medical case notes.

The CT scans were obtained using an EMI 1010 head scanner. On each patient at least eight 10 mm cuts were obtained parallel to the canthomeatal line. The CT scans of all the patients and controls were rated on a four-point scale (0–3) for ventricular enlargement, cortical atrophy (based on widths of sulcal, inter-hemispheric and Sylvian fissures), and temporal lobe atrophy or abnormality. The rating method was that used by Jacoby *et al* (1980). Scores were recorded for left and right sides of the brain. The scans were rated independently by two raters (RJH and HF), who were blind to diagnosis. The inter-rater reliability was 0.83 or better for each of the evaluated items (Dawid & Skene, 1979). Significance was estimated with a non-parametric one-way analysis of variance for ordinal numbers (Kruskal & Wallis, 1953).

Table 1
Abnormalities of brain structure in patients with late paraphrenia with and without first-rank symptoms, and normal controls

	Controls ($n=40$)	Late paraphrenics without FRS ($n=25$)		Late paraphrenics with FRS ($n=16$)
Cortical atrophy				
absent	18 (45%)	9 (36%)		11 (69%)
mild	20 (50%)	14 (56%)	*	5 (31%)
moderate	2 (5%)	2 (8%)		-
severe	-	-		-
Ventricular enlargement				
absent	18 (45%)	13 (52%)		9 (56%)
mild	20 (50%	10 (40%)		7 (44%)
moderate	2 (5%)	2 (8%)		-
severe	-	-		-

*ANOVA (Kruskal - Wallis), $P<0.05$.

Results

Sixteen of the late paraphrenics had FRS. The average age of the late paraphrenics with FRS was 73.3 (range 60–86) years, of the late paraphrenics without FRS 76.9 (range 68–86) years, and of the controls 74.9 (60–96) years. There was no significant difference between the age structures of the groups. There were no significant differences in the ventricular size or temporal lobe appearances between the three groups. There was, however, significantly greater cortical atrophy in the late-paraphrenic group without FRS ($P<0.01$), when compared with the group of late paraphrenics with FRS. Table 1 shows the distribution of varying degrees of cortical atrophy and size of the lateral ventricles among the groups. The data in Table 1 are pooled from both sides of the brain; there were no significant differences between the right and left sides on any of the assessed parameters.

Discussion

This study demonstrates a statistically significant inverse relationship between the presence of FRS and cortical atrophy in patients with late paraphrenia. This supports the hypothesis of Jacoby & Levy (1980), that a grossly intact cortex is required for complex psychotic symptoms. The presence of FRS in a patient with late paraphrenia may have prognostic significance for identifying those patients who are less likely to develop dementia, although CT measures of ventricular size in late paraphrenia have already been shown not to predict cognitive deterioration at follow-up (Hymas *et al*, 1989).

Failure of this study to demonstrate more temporal lobe abnormality among the late paraphrenic groups with or without FRS compared with controls does not (at least in late paraphrenia) support Trimble's theory (1990) about the significance of these symptoms. Visualisation by CT of temporal lobe structures is poor however, particularly on the old EMI 1010 scans. The application of magnetic resonance imaging to these patients will allow superior visualisation, and better identification, of temporal lobe abnormalities.

Our finding of no increase in lateral ventricular volume in either of the late-paraphrenic groups differs from that of earlier studies that examined the same series of patients (Naguib & Levy, 1987; Burns *et al*, 1989). We rated the scans with a visual analogue system, rather than measuring ventricle:brain ratios (VBRs) as previous investigators did, and it may be that the degree of ventricular enlargement in late paraphrenia is too small to be detected by visual methods and can only be demonstrated by determination of VBR. The cortical observations in the control and patient groups are so marked as to be reproduced between studies. It is possible that apparently functional cases of late paraphrenia with FRS represent late-onset schizophrenia (Holden, 1987), while those without FRS are a heterogeneous group of paranoid states with subtle underlying organic features, shown by the greater degree of cortical atrophy observed in this group.

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